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EXAMINER	
BALL, JOHN C	

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1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,939	VIGH ET AL.	
	Examiner	Art Unit	
	J. CHRISTOPHER BALL	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/08/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. This is the initial Office Action based on the GYULA et al. application filed under the Patent Cooperation Treaty on October 25, 2004, and now a National Stage Entry application.

2. Claims 1-59 are currently pending and have been fully considered.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the anode 30 and cathode 35 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional

replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "5" has been used to designate both compression member and threaded rod and nut assembly in the lower right hand side of Figure 1A. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 19 in Figure 2B. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

7. Claims 14 and 25 objected to because of the following informalities: Both claims recite the term "weekly" when describing an acidic functional group. It is believed the term "weakly" was meant to be used. Appropriate correction is required.

8. Claim 59 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 58. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Invocation of 35 USC § 112, sixth paragraph

9. When claim language invokes 35 USC 112, sixth paragraph, a limit on is set on how broadly the PTO may construe means-plus-function language under the rubric of reasonable interpretation (See *Donaldson*, 16 F.3d at 1194, 29 USPQ2d at 1850). Additionally, the Federal Circuit has held that applicants before the USPTO have the opportunity and the obligation to define their inventions precisely during proceedings before the PTO (See *In re Morris*, 127 F.3d 1048, 1056–57, 44 USPQ2d 1023, 1029–30 (Fed. Cir. 1997). A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

(A) the claim limitations must use the phrase "means for " or "step for; "

(B) the "means for " or "step for " must be modified by functional language; and

(C) the phrase "means for " or "step for " must not be modified by sufficient structure, material, or acts for achieving the specified function.

10. Instant claims 1, 16, and 61 each recite in part the limitation "means for addition or removal". This limitation utilize the terms "means for"; the "means for" is modified by functional language, specifically "addition or removal"; and the phrase "means for" is not modified by sufficient structure, material, or acts for achieving the specified function. Therefore, claims 1, 16, and 51 have invoked 35 USC 112, sixth paragraph. Therefore, this limitation will be interpreted as pertaining only to the corresponding structure, material or acts described in the specification, namely an opening, or equivalents thereof.

11. Instant claims 2, 3, 17, and 18 each recite in part the limitation "sealing means". This limitation utilize the term that is equivalent to "means for" (*Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356, 50 USPQ2d 1372, 1374– 75 (Fed. Cir.1999); the "means for" is modified by functional language, specifically "sealing"; and the phrase "means for" is not modified by sufficient structure, material, or acts for achieving the specified function. Therefore, claims 2, 3, 17, and 18 have invoked 35 USC 112, sixth paragraph. Therefore, this limitation will be interpreted as pertaining only to the corresponding structure, material or acts

described in the specification, namely any water insoluble polymer, natural or synthetic, or equivalents thereof.

12. Instant claim 4 and 19 each recite in part the limitation "sealing means". This limitation utilize the term that is equivalent to "means for" (*Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356, 50 USPQ2d 1372, 1374– 75 (Fed. Cir.1999); the "means for" is modified by functional language, specifically "sealing"; however the phrase "means for" is modified by sufficient structure, material, or acts for achieving the specified function. Therefore, claims 4 and 19 have not invoked 35 USC 112, sixth paragraph.

13. Instant claims 6 and 21 each recites in part the limitation "housing means". This limitation utilize the term that is equivalent to "means for" (*Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356, 50 USPQ2d 1372, 1374– 75 (Fed. Cir.1999); the "means for" is modified by functional language, specifically "housing"; and the phrase "means for" is not modified by sufficient structure, material, or acts for achieving the specified function. Therefore, claims 6 and 21 have invoked 35 USC 112, sixth paragraph. Therefore, this limitation will be interpreted as pertaining only to the corresponding structure, material or acts described in the specification, namely a material having a thermal conductivity greater than about 1 W/mK and a specific heat greater than about 100 J/kgK, or is selected from the

group consisting of alumina, aluminum nitride, zirconia, zirconium nitride, boron nitride, silicon nitride, silicon carbide, ceramics, fused silica, quartz, glass or any combination thereof, or equivalents thereof.

14. Instant claim 7, 8, 22, and 23 each recite in part the limitation "housing means". This limitation utilize the term that is equivalent to "means for" (*Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356, 50 USPQ2d 1372, 1374– 75 (Fed. Cir.1999); the "means for" is modified by functional language, specifically "sealing"; however the phrase "means for" is modified by sufficient structure, material, or acts for achieving the specified function. Therefore, claims 7, 8, 22, and 23 have not invoked 35 USC 112, sixth paragraph.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 57-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of claims 57-59 recited that what is claimed is an invention "substantially as shown and described" in the drawings of the instant application. This does not adequately define what is being claim, and therefore is indefinite.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. Claims 1-4, 6-14, 16-19, 21-25, 27-51, 54, 55, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over SAMMONS et al. (US 5,662,813) in view of TARNOPOLSKY (US 5,032,247), as evidenced by the webpage entitled "Crystal Quartz (SiO_2) and Fused Silica" (http://ww.mt-berlin.com/frames_cryst/descriptions/quartz%20.htm, printed March 21, 2005,

herein after "WEBPAGE"), all submitted to the Office on an Information Disclosure Statement.

Regarding claims 1, 16, 50, and 51, SAMMONS discloses an electrophoresis apparatus, comprising: an anode and cathode disposed in respective compartments (61 and 64, Figure 5) with means for addition or removal of a solution (11 and 13, Figure 2), the compartments inherently having a width dimension, substantially orthogonal to the direction of the electric field, a depth dimension, substantially orthogonal to the direction of the electric field and substantially orthogonal to the width, and a length dimension, substantially parallel to the electric field and substantially orthogonal to both the width and depth;

ion-permeable barriers that prevent convective mixing (17, Figure 4) disposed between the compartments;

separate compartments disposed between the anode and cathode compartments (Figure 5);

and with a portion of each compartment (cooling lines 14, Figures 3-4) made from a heat-conductive material, optionally ceramic (Col. 5, lines 49-55). SAMMONS additionally teaches an aspect ratio of 1/250 (Col. 4, lines 30-34).

SAMMONS does not explicitly recite that the material composing the compartments has a given value for either thermal conductivity or specific heat.

However, TARNOPOLSKY discloses a membrane separation apparatus, wherein is taught a coolant is flowed through hollow silica fibers in the chambers (Abstract). It is shown by the WEBPAGE that the thermal conductivity of fused silica is 1.46 W/m·K and the specific heat of fused silica is 670-740 J/K·kg.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the apparatus as taught by SAMMONS by utilizing the silica, as taught by TARNOPOLSKY, as the cooling line comprising a part of the compartments because the silica would more efficiently conduct heat than plastic materials, resulting in more effective cooling that suggested by SAMMONS in utilization of ceramics for this purpose. (SAMMONS, Col. 5, lines 49-55).

Regarding claims 2-4 and 17-19, SAMMONS teaches polymeric sealing material between the compartments (Col. 4, lines 34-43).

Regarding claims 6-8 and 21-23, SAMMONS teaches housing comprising ceramic materials (Figure 2-4, 12, and 14; Col. 5, lines 49-55).

Regarding claims 9 and 24, SAMMONS teaches an electrically insulating material as part of the anode and cathode compartments as a generic ceramic, while TARNOPOLSKY discloses a membrane separation apparatus, wherein is taught a coolant is flowed through hollow silica fibers in the chambers (Abstract).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the apparatus as taught by SAMMONS by utilizing the silica, as taught by TARNOPOLSKY, as the cooling line comprising a part of the compartments because the silica would more efficiently conduct heat than plastic materials, resulting in more effective cooling that suggested by SAMMONS in utilization of ceramics for this purpose. (SAMMONS, Col. 5, lines 49-55).

Regarding claims 10-13, 32-35, and 38-41, SAMMONS teaches chambers with an aspect ratio of 1/250 (Col. 4, lines 30-34).

Regarding claims 14, 25, and 54, SAMMONS teaches woven polymer membranes, which would be essentially free from weakly acidic or basic functional groups, anionic functional groups, and cationic functional groups (Col. 4, lines 44-48).

Regarding claim 27-30, SAMMONS teaches a first dimension being as low as 2 mm (Col. 4, lines 30-34). It has been held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (*Gardner v. TEC Systems, Inc.*, 725

F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)).

Regarding claims 31, 48, and 49, SAMMONS teaches at least first and second separation compartment (Figure 5). It has been held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)).

Regarding claims 36 and 37, SAMMONS teaches the third dimension of the at least one separation compartment is less than 1/2 or 1/3 of the distance between the anode and cathode (Col. 4, lines 30-34).

Regarding claims 42-47, SAMMONS teaches an apparatus with twelve separation compartments (Figure 5). It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced (*In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)).

Regarding claim 55, SAMMON, as modified by TARNOPOLSKY, teaches the apparatus of claim 1. SAMMON also discloses a method for altering a composition of a sample by electrophoresis, the method comprising:

selecting an ion-permeable barrier for use between the anode and cathode compartments (17, Figure 4; Col. 4, lines 44-52);

providing electrolytes to the anode and cathode compartments (Col. 3, lines 51-52);

providing the sample to at least one of the compartments (58 to 72 to 73, Figure 5);

creating an electrophoretic direct current between the anode and cathode by applying an electrical potential between the anode and cathode (Col. 3, lines 47-50); and

causing a transfer of at least one part of at least one component of the sample across the ion-permeable barrier (Col. 8, lines 12-19).

Regarding claim 56, SAMMON, as modified by TARNOPOLSKY, teaches the apparatus of claim 16. SAMMON also discloses a method for altering a composition of a sample by electrophoresis, the method comprising:

selecting an ion-permeable barrier for use between the anode and cathode compartments (17, Figure 4; Col. 4, lines 44-52);

providing at least one electrolyte to any of the compartments free of the sample (90, Figure 5);

providing the sample to at least one of the compartments (58 to 72 to 73, Figure 5);

creating an electrophoretic direct current between the anode and cathode by applying an electrical potential between the anode and cathode (Col. 3, lines 47-50); and

causing a transfer of at least one part of at least one component of the sample across the ion-permeable barrier (Col. 8, lines 12-19).

20. Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over SAMMONS et al. (US 5,662,813) in view of TARNOPOLSKY (US 5,032,247), as evidenced by the webpage entitled "Crystal Quartz (SiO_2) and Fused Silica" (http://ww.mt-berlin.com/frames_cryst/descriptions/quartz%20.htm, printed March 21, 2005, herein after "WEBPAGE") as applied to claims 1-4, 6-14, 16-19, 21-25, 27-51, 54, 55, and 56 above, and further in view of CHLANDA et al. (US 5,126,026), submitted to the Office on an Information Disclosure Statement.

Regarding claim 5 and 20, SAMMONS, as modified by TARNOPOLSKY, teaches the limitations of claim 1-4 and 16, 17, and 19, as outlined above. SAMMONS also teaches utilizing silicone rubber for sealing, but does suggest use of other suitable materials (Col. 4, lines 35-43).

SAMMONS and TARNOPOLSKY do not explicitly teach use of a material selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polyalkylenes, polyfluorocarbons, poly(dimethylsiloxane), poly(diallcylsiloxane), poly(alkylarylsiloxane), poly(diarylsiloxane), poly(ether ether ketones) or a combination thereof.

However, CHLANDA discloses guard membranes for using in electrodialysis cell, wherein is taught polyethylene gaskets for sealing chambers (Col. 13, lines 34-37 and 47-51).

At the time of the present invention, the substitution of one known material, the polyethylene as taught by CHLANDA, for another, the silicone rubber as taught by SAMMONS, would have yield predictable result to one of ordinary skill in the art (*KSR International Co. v. Teleflex Inc., 550 U.S.__, 82 USPQ2d 1385 (2007)*).

21. Claims 15, 26, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over SAMMONS et al. (US 5,662,813) in view of TARNOPOLSKY (US 5,032,247), as evidenced by the webpage entitled "Crystal Quartz (SiO_2) and Fused Silica" (http://ww.mt-berlin.com/frames_cryst/descriptions/quartz%20.htm, printed March 21, 2005, herein after "WEBPAGE") as applied to claims 1-4, 6-14, 16-19, 21-25, 27-51,

54, 55, and 56 above, and further in view of EGEN et al. (US 5,173,164), submitted to the Office on an Information Disclosure Statement.

Regarding claim 15, 26, 52, and 53, SAMMONS, as modified by TARNOPOLSKY, teaches the limitations of claims 1, 16, and 51, as outlined above.

SAMMONS and TARNOPOLSKY do not explicitly teach the barriers are isoelectric barriers.

However, EGEN discloses a multi-modal electrical separator, wherein is taught membranes which could fairly be considered isoelectric barriers, given the specific buffer system specified (Col. 8, lines 33-49).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the barriers as taught by SAMMONS with the barriers as taught by EGEN because SAMMONS explicitly suggest suitable usage of the disclosed system and method of EGEN by incorporating by reference the disclosure of EGEN (SAMMONS, Col. 2, lines 2-6).

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. OGLE et al., “Preparative-scale isoelectric trapping

separations using a modified Gradiflow unit", JOURNAL OF CHROMATOGRAPHY A, vol. 979, 2002, p. 155-161.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. CHRISTOPHER BALL whose telephone number is (571)270-5119. The examiner can normally be reached on Monday through Thursday, 9 am to 5 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

JCB
04/21/2010